

## IN THE CLAIMS:

Please amend the claims to read as follows:

1. (Currently amended) A method of obtaining predictive information for inhomogeneous financial time series, comprising the steps of:  
~~electronically receiving financial market transaction data over an electronic network;~~  
~~electronically storing in a computer readable medium said received financial market transaction data;~~  
constructing an inhomogeneous time series  $z$  that represents said received financial market transaction data;  
constructing an exponential moving average operator EMA [ $\tau$ ;  $z$ ];  
constructing an iterated exponential moving average operator based on said exponential moving average operator;  
constructing a time-translation-invariant, causal operator  $\Omega[z]$  that is a convolution operator with kernel  $\omega$  and that is based on said iterated exponential moving average operator; and  
electronically calculating values of one or more predictive factors relating to said time series  $z$ , wherein said one or more predictive factors are defined in terms of said operator  $\Omega[z]$ ; ~~and~~  
~~electronically storing in a computer readable medium said calculated values of one or more predictive factors.~~

2. (Original) The method of claim 1, wherein said operator  $\Omega[z]$  has the form:

$$\begin{aligned}\Omega[z](t) &= \int_{-\infty}^t dt' \omega(t-t') z(t') \\ &= \int_0^{\infty} dt' \omega(t') z(t-t').\end{aligned}$$

3. (Previously presented) The method of claim 1, wherein said exponential moving average operator  $\text{EMA}[\tau ; z]$  has the form:

$$\text{EMA}[\tau ; z](t_n) = \mu \text{EMA}(\tau; z)(t_{n-1}) + (v - \mu) z_{n-1} + (1 - v) z_n, \text{ with}$$

$$\alpha = \frac{t_n - t_{n-1}}{\tau}$$

$$\mu = e^{-\alpha},$$

where  $\nu$  depends on a chosen interpolation scheme.

4. (Original) The method of claim 1, wherein said operator  $\Omega[z]$  is a differential operator  $\Delta[\tau]$  that has the form:

$$\Delta[\tau] = \gamma(\text{EMA}[\alpha\tau, 1] + \text{EMA}[\alpha\tau, 2] - 2\text{EMA}[\alpha\beta\tau, 4]),$$

where  $\gamma$  is fixed so that the integral of the kernel of the differential operator from the origin to the first zero is 1;  $\alpha$  is fixed by a normalization condition that requires  $\Delta[\tau; c] = 0$  for a constant  $c$ ; and  $\beta$  is chosen in order to get a short tail for the kernel of the differential operator  $\Delta[\tau]$ .

5. (Original) The method of claim 4 wherein said one or more predictive factors comprises a return of the form  $r[\tau] = \Delta[\tau; x]$ , where  $x$  represents a logarithmic price.

6. (Original) The method of claim 1 wherein said one or more predictive factors comprises a momentum of the form  $x - \text{EMA}[\tau; x]$ , where  $x$  represents a logarithmic price.

7. (Original) The method of claim 1 wherein said one or more predictive factors comprises a volatility.

8. (Original) The method of claim 7 wherein said volatility is of the form:

$$\text{Volatility}[\tau, \tau', p; z] = \text{MNorm}[\tau/2, p; \Delta[\tau'; z]], \text{ where}$$

$$\text{MNorm}[\tau, p; z] = \text{MA}[\tau; |z|^p]^{1/p}, \text{ and}$$

$$\text{MA}[\tau, n] = \frac{1}{n} \sum_{k=1}^n \text{EMA}[\tau', k], \text{ with } \tau' = \frac{2\tau}{n+1},$$

and where  $p$  satisfies  $0 < p \leq 2$ , and  $\tau'$  is a time horizon of a return  $r[\tau] = \Delta[\tau; x]$ , where  $x$  represents a logarithmic price.

9. (Currently amended) A method of obtaining predictive information for inhomogeneous financial time series, comprising the steps of:

~~electronically receiving financial market transaction data over an electronic network;~~

~~electronically storing in a computer readable medium said received financial market transaction data;~~

constructing an inhomogeneous time series  $z$  that corresponds to said received financial market transaction data;

constructing an exponential moving average operator;

constructing an iterated exponential moving average operator based on said exponential moving average operator;

constructing a time-translation-invariant, causal operator  $\Omega[z]$  that is a convolution operator with kernel  $\omega$  and that is based on said iterated exponential moving average operator;

constructing a standardized time series  $z$ ; and

electronically calculating values of one or more predictive factors relating to said time series  $z$ , wherein said one or more predictive factors are defined in terms of said standardized time series  $z$ ; ~~and~~

~~electronically storing in a computer readable medium said calculated values of one or more predictive factors.~~

10. (Original) The method of claim 9 wherein the standardized time series  $z$  is of the form:

$$\hat{z}[\tau] = \frac{z - MA[\tau; z]}{MSD[\tau; z]}$$

where

$$MA[\tau, n] = \frac{1}{n} \sum_{k=1}^n EMA[\tau', k], \text{ with } \tau' = \frac{2\tau}{n+1}, \text{ and}$$

where  $MSD[\tau, p; z] = MA[\tau; |z - MA[\tau; z]|^p]^{1/p}$ .

11. (Original) The method of claim 9 wherein said one or more predictive factors comprises a moving skewness.

12. (Previously presented) The method of claim 11 wherein said moving skewness is of the form:

$$MSkewness[\tau_1, \tau_2; z] = MA[\tau_1; \hat{z}[\tau_2]^3]$$

where  $\tau_1$  is the length of a time interval around time "now" and  $\tau_2$  is the length of a time interval around time "now- $\tau$ ".

13. (Original) The method of claim 12 wherein the standardized time series  $\hat{z}$  is of the form:

$$\hat{z}[\tau] = \frac{z - MA[\tau; z]}{MSD[\tau; z]}$$

where

$$MA[\tau, n] = \frac{1}{n} \sum_{k=1}^n EMA[\tau', k], \text{ with } \tau' = \frac{2\tau}{n+1}, \text{ and}$$

where  $MSD[\tau, p; z] = MA[\tau; |z - MA[\tau; z]|^p]^{1/p}$ .

14. (Original) The method of claim 9 wherein said one or more predictive factors comprises a moving kurtosis.

15. (Original) The method of claim 14 wherein said moving kurtosis is of the form  $MKurtosis[\tau_1, \tau_2; z] = MA[\tau_1; \hat{z}[\tau_2]^4]$ ,

where  $\tau_1$  is the length of a time interval around time "now" and  $\tau_2$  is the length of a time interval around time "now- $\tau$ ."

16. (Original) The method of claim 15 wherein the standardized time series  $\hat{z}$  is of the form:

$$\hat{z}[\tau] = \frac{z - MA[\tau; z]}{MSD[\tau; z]}$$

where

$$MA[\tau, n] = \frac{1}{n} \sum_{k=1}^n EMA[\tau', k], \text{ with } \tau' = \frac{2\tau}{n+1}, \text{ and}$$

where  $MSD[\tau, p; z] = MA[\tau; |z - MA[\tau; z]|^p]^{1/p}$ .

17. (Currently amended) A method of obtaining predictive information for inhomogeneous financial time series, comprising the steps of:

~~electronically receiving financial market transaction data over an electronic network;~~

~~electronically storing in a computer readable medium said received financial market transaction data;~~

constructing an inhomogeneous time series  $z$  that corresponds to said received financial market transaction data;

constructing an exponential moving average operator  $EMA[\tau; z]$ ;

constructing an iterated exponential moving average operator based on said exponential moving average operator  $EMA[\tau; z]$ ;

constructing a time-translation-invariant, causal operator  $\Omega[z]$  that is a convolution operator with kernel  $\omega$  and time range  $\tau$ , and that is based on said iterated exponential moving average operator;

constructing a moving average operator MA that depends on said EMA operator;

constructing a moving standard deviation operator MSD that depends on said MA operator; and

electronically calculating values of one or more predictive factors relating to said time series  $z$ , wherein said one or more predictive factors depend on one or more of said operators EMA, MA, and MSD; ~~and~~

~~electronically storing in a computer-readable medium said calculated values of one or more predictive factors.~~

18. (Original) The method of claim 17 wherein said one or more predictive factors comprises a moving correlation.

19. (Original) The method of claim 18 wherein said moving correlation is of the form:

$$MCorrelation[\hat{y}, \hat{z}](t) = \int \int dt' dt'' c(t', t'') \hat{y}(t - t') \hat{z}(t - t'').$$

20. (Currently amended) A method of obtaining predictive information for inhomogeneous financial time series, comprising the steps of:

~~electronically receiving financial-market transaction data over an electronic network;~~

~~electronically storing in a computer-readable medium said received financial market transaction data;~~

constructing an inhomogeneous time series  $z$  that corresponds to ~~said~~ received financial market transaction data;

constructing a complex iterated exponential moving average operator  $EMA[\tau; z]$ , with kernel  $ema$ ;

constructing a time-translation-invariant- , causal operator  $\Omega[z]$  that is a convolution operator with kernel  $\omega$  and time range  $\tau$ , and that is based on said complex iterated exponential moving average operator;

constructing a windowed Fourier transform WF that depends on said EMA operator; and

electronically calculating values of one or more predictive factors relating to said time series  $z$ , wherein said one or more predictive factors depend on said windowed Fourier transform; ~~and~~

~~electronically storing in a computer readable medium said calculated values of one or more predictive factors.~~

21. (Previously presented) The method of claim 20 wherein said complex iterated exponential moving average operator EMA has a kernel  $ema$  of the form:

$$ema[\varsigma, n](t) = \frac{1}{(n-1)!} \left( \frac{t}{\tau} \right)^{n-1} \frac{e^{-\varsigma t}}{\tau}$$

where  $\varsigma \in C$ , with  $\varsigma = \frac{1}{\tau}(1 + ik)$ .

22. (Original) The method of claim 20 wherein EMA is computed using the iterative computational formula:

$$EMA[\varsigma; z](t_n) = \mu EMA[\varsigma; z](t_{n-1}) + z_{n-1} \frac{\nu - \mu}{1 + ik} + z_n \frac{1 - \nu}{1 + ik}, \text{ with}$$

$$\alpha = \zeta(t_n - t_{n-1})$$

$$\mu = e^{-\alpha}$$

where  $\nu$  depends on a chosen interpolation scheme.

23. (Original) The method of claim 20 wherein said windowed Fourier transform has a kernel  $wf$  of the form:

$$wf[\tau, k, n](t) = \frac{1}{n} \sum_{j=1}^n ema[\varsigma, j](t).$$

24. (Previously presented) The method of claim 23 wherein said  $ema$  is of the form:

$$ema[\varsigma, n](t) = \frac{1}{(n-1)!} \left( \frac{t}{\tau} \right)^{n-1} \frac{e^{-\varsigma t}}{\tau}$$

where  $\varsigma \in C$  with  $\varsigma = \frac{1}{\tau}(1 + ik)$ .

25. (Currently amended) A method of obtaining predictive information for inhomogeneous time series, comprising the steps of:

~~electronically receiving time series data over an electronic network;~~  
~~electronically storing in a computer readable medium said received time series~~  
~~data;~~  
constructing an inhomogeneous time series  $z$  that represents said time series data;  
constructing an exponential moving average operator;  
constructing an iterated exponential moving average operator based on said  
exponential moving average operator;  
constructing a time-translation-invariant, causal operator  $\Omega[z]$  that is a  
convolution operator with kernel  $\omega$  and that is based on said iterated exponential moving  
average operator; and  
electronically calculating values of one or more predictive factors relating to said  
time series  $z$ , wherein said one or more predictive factors are defined in terms of said  
operator  $\Omega[z]$ ; and  
~~electronically storing in a computer readable medium said calculated values of~~  
~~one or more predictive factors.~~